UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,346	12/04/2001	Sang Hun Sung	HI-0049	9720

				EXAMINER
34610	7590	03/03/2005		GHULAMALI, QUTBUDDIN

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ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/000,346	SUNG, SANG HUN
	Examiner	Art Unit
	Qutub Ghulamali	2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _14 December 2001_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _11/12/2004_.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 8-16, and 20-22 are rejected under 35 U.S.C. 102(e) as being anticipated by

Ozukturk et al (US Patent 6,049,535).

Regarding claim 8, Ozukturk discloses a communication system for estimating phase

information, comprising:

estimating synchronization data, based on received data (fig. 17, element 1730, 1304) (col. 45,

lines 15-35; col. 47, lines 50-55);

generating decoded data based on the received data and a code (col. 45, lines 50-56); and

outputting an average value of the phase information obtained by averaging the synchronization

data and the decoded data (col. 45, lines 45-67; col. 26, lines 60-67; col. 27, lines 1-18).

Regarding claims 14 and 20, Ozukturk discloses:

generating a synchronization signal and a converted phase value with a matched filter (1710)

based on received data (fig. 17, element 1730, 1304) (col. 45, lines 15-35; col. 46, lines 22-25);

establishing an average period based on the synchronization signal (col. 45, lines 50-56); and

averaging the converted phase value with decoded data during the averaging period to create the

phase information for the averaging period (col. 45, lines 45-67; col. 26, lines 60-67; col. 27,

lines 1-18).

Regarding claim 9, Ozukturk discloses generating a Cos signal and a Sin signal to

identify a converted phase value of the received data in a pilot signal (col. 54, lines 1-8).

Regarding claim 10, Ozukturk shows the average value is initialized using the

synchronization data (col. 27, lines 12-17).

Regarding claim 11, Ozukturk discloses a code (code period for the CDMA spreading

code) corresponds to a synchronization time of the synchronization data (estimating the

synchronization is to generate an accurate point of time) (col. 20, lines 18-21; col. 27, lines 12-

17).

Regarding claims 12 and 13, Ozukturk discloses averaging the converted phase value of

the pilot signal and the decoded data to obtain the phase information (col. 31, lines 1-25).

Regarding claims 15, 16, 21 and 22, Ozukturk discloses (fig. 14) multiplying the received

data, received during the averaging period, by a pseudo-noise (PN) code to form the decoded

data (col. 44, lines 26-36).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 17-19, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ozukturk et al (US Patent 6,049,535) in view of Petranovich (US Patent 5,376,894).

Regarding claims 17 and 23, Ozukturk discloses every feature of the claimed limitations

as set forth in the discussion above for claim 14 above. Ozukturk, however, is silent about the

specific details of synchronization preamble within the received data. In a similar field of

endeavor, Petranovich discloses:

the synchronization signal is generated based on a synchronization preamble within the received

data (col. 3, lines 12-22);

the converted phase value is generated based on a phase preamble within the received data (col.

3, lines 15-22, 25-35); and

the converted phase value identifies a phase shift in the received data (fig. 16; col. 11, lines 20-

28). It would have been obvious to one skilled in the art at the time the invention was made to

have synchronization signal and phase value generated based on a synchronization preamble and

the converted phase value identify a phase shift in the received data as taught by Petranovich in

the circuit of Ozukturk so as to allow the demodulator to synchronize its timing and decode the

received signal data (symbols).

Regarding claims 18 and 24, Ozukturk discloses every feature of the claimed limitations

as set forth in the discussion above for claim 14 above. Ozukturk is silent regarding the

converted phase value identifies a phase shift in a transition between symbols of the received

data and multiple phases. In a similar field of endeavor, Petranovich discloses: the converted

phase value identifies a phase shift in a transition between symbols of the received data (col. 4,

lines 44-61); and the symbols are represented by multiple phases (col. 4 lines 55-61). It would

have been obvious to one skilled in the art at the time the invention was made to use converted

phase value identify a phase shift in a transition between symbols of the received data and the

symbols represented by multiple phases as taught by Petranovich in the system of Ozukturk

because it can minimize error in phase of the received signal.

Regarding claims 19 and 25, Ozukturk discloses every feature of the claimed limitations

as set forth in the discussion above for claim 14 above. Ozukturk is silent regarding specifics of

averaging a current and previous data to create phase information. In a similar field of endeavor,

Petranovich discloses:

The decoded data received during a current averaging period with the phase information of a

previous averaging preriod to create the phase information for the current averaging period (col.

9, lines 32-45). Therefore, it would have been obvious to person skilled in the art at the time the

invention was made to use specifics of averaging a current and previous data to create phase

information as taught by Petranovich in the system of Ozukturk because it can provide output

indicative of whether there is a change in the consecutive values of the signal.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6.   Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by

Petranovich US Patent 5,376,894).

7.   Regarding claim 1, Petranovich discloses a communication system comprising:

a matched filter (fig. 7, element 30) that outputs converted synchronization signals, based on received data, and converted information of the received data (col. 6, lines 27-45, 64-67; col. 7, lines 1-2);

a CPU (22) that receives the converted synchronization signals and the converted information to provide a first output signal based on at least one of the converted synchronization signals and the converted information outputted from the matched filter (col. 7, lines 60-67; col. 8, lines 1-12); and a phase estimator (fig. 12) that generates decoded data based on the received data, the estimator having a first averager that receives the first output signal from the CPU and the decoded data to generate the phase information (col. 8, lines 1-31; col. 9, lines 57-61; col. 10, lines 15-19, 53-61).

Regarding claim 2, Petranovich discloses an apparatus for estimating phase information conprising:

a first delayer (fig. 14) receiving the phase information and outputting delayed phase information to the first averager, wherein the first averager generates subsequent phase information based on the delayed phase information and the decoded data (col. 10, lines 53-67; col. 11, lines 1-20).

Regarding claim 4, Petranovich discloses the apparatus comprises: a second delayer receiving the phase information and outputting delayed phase information to a second averager, wherein a second averager of the phase estimator generates the subsequent phase information based on the decoded data and the delayed phase information received from the second delayer (fig. 13; col. 10, lines 15-25, 53-65).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

9.   Claims 3, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petranovich

(US Patent 5,376,894) in view of Ozukturk et al (US Patent 6,049,535).

Regarding claim 3, Petranovich discloses substantially the claimed limitations as set forth

in the discussion above for claim 1. Petranovich however, is silent regarding "converted

information comprise at least one of a cosine A signal and a sine A signal generated by the

matched filter". In a similar field of endeavor, Ozukturk discloses converted information

comprise at least one of a cosine A signal and a sine A signal (a complex phasor) generated by

the matched filter (col. 54, lines 1-8). It would have been obvious to one skilled in the art at the

time the invention was made to have a matched filter output converted information of sine and

cosine signals as taught by Ozukturk in the circuit of Petranovich so as to obtain maximization in

phase values generated by the matched filter.

Regarding claim 5, Petranovich discloses substantially the claimed limitations as set forth

in the discussion above for claim 1. Petranovich, however, is silent regarding signals are at least

one of locked position and locked energy signals; and the converted information is at least one of

a cosine and a sine signal. In a similar field of endeavor, Ozukturk in a similar field of endeavor,

discloses a signal value of locked position (lock point) and locked energy signals (maximize

signal-to-noise ratio; col. 27, lines 10-17) and the converted information is at least a Cosine and a

Sine signal (col. 54, lines 1-8). It would have been obvious to one skilled in the art at the time

the invention was made to use locked position and locked energy signals and at least a cosine

and a sine signal as taught by Ozukturk in the phase estimation and synchronization circuit of

Petranovich because it can enhance tracking and synchronization with the incoming signals.

Regarding claim 6, Petranovich discloses substantially the claimed limitations as set forth

in the discussion above for claim 1 including averaging data from the adders (col. 10, lines 53-

67; col. 11, lines 1-20). Petranovich, however, is silent regarding plurality of multipliers that

multiply the received data and a code; and an adder that adds the outputs from the multipliers.

Ozukturk, in a similar field of endeavor, discloses a (fig. 7), a plurality of multipliers that

multiply the received data and a code (col. 33, lines 60-67), an adder that adds data outputted

from the multipliers (col. 34, lines 1-12). It would have been obvious to a person skilled in the

art at the time the invention was made to use multipliers that multiply the received data and a

code; and an adder that adds the outputs from the multipliers as taught by Ozukturk in the phase

estimation circuit of Petranovich because it can compensate for the channel response and the

carrier phase rotation of the different multipath signals.

Regarding claim 7, Petranovich discloses substantially the claimed limitations as set forth

in the discussion above for claim 1, Petranovich, however, is silent regarding "converted

information is a changed phase value of a pilot signal outputted from the matched filter and the

CPU provides the converted information as the first output signal to initialize the first averager".

Ozukturk in a similar field of endeavor discloses, converted information is a changed phase

value of a pilot signal outputted from the matched filter (col. 54, lines 1-8) and the CPU provides

the converted information as the first output signal to initialize (reset signal) the first averager

(col. 47, lines 50-60; col. 49, lines 16-18).

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

US Patents:

Durrant et al (US 5,963,586) discloses technique for modulating and demodulating spread

spectrum signals and a receiver that decodes the phase encoded data.

Kubo et al (US 6,456,827) shows a communication control apparatus estimate the relative speed

of stations and adjust the values of communication parameters for a searcher.

Fenton (US 5,414,729) discloses a receiver for PRN encoded signals.

Avidor et al (US 2002/0122505) shows a frequency and phase estimation for MPSK signals.

Kay et al (US 6,836,515) discloses a multi-modulation radio communications system.

Gelin et al (US Patent 5,151,925) discloses a coherent demodulation method for a digitally

modulated signal.

11.   Any inquiry concerning this communication or earlier communications from the

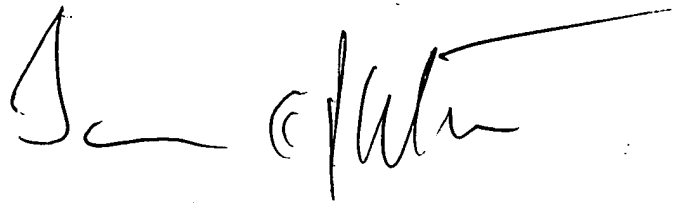examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014.

The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG.
February 23, 2005.

JAY K. PATEL
SUPERVISORY PATENT EXAMINER